Removal & Installation - 01M

APPLICATION

TRANSAXLE APPLICATION

Application	Transaxle Model
Cabrio (2001-02)	01M 4-Speed
Golf, GTI, Jetta & New Beetle	01M 4-Speed

REMOVAL & INSTALLATION

CABRIO

NOTE: In the following procedures, letters and numbers in parenthesis are shown in illustrations.

NOTE: When battery is disconnected, vehicle computer and memory systems may lose memory data. Driveability problems may exist until computer systems have completed a relearn cycle.

CAUTION: Radio/cassette or radio/CD player is equipped with an anti-theft protection circuit. Whenever battery is disconnected, radio will go into anti-theft mode. When battery is reconnected, radio will display CODE, and will be inoperative until proper code number is entered. Obtain security code before disconnecting battery.

Removal & Installation

WARNING: Vehicle is equipped with Supplemental Inflatable Restraint (SIR) system. When servicing vehicle, use care to avoid accidental air bag deployment. SIR system-related components are located in various locations throughout interior and exterior of vehicle, depending on application. Do not use electrical test equipment on or near these circuits. If necessary, deactivate SIR system before servicing components. See appropriate AIR BAG DEACTIVATION PROCEDURES article in GENERAL INFORMATION.

1. Disconnect negative battery cable. Disconnect speedometer connector at transaxle. Disconnect vehicle speed sensor connector. Remove electrical connections (arrows) at transaxle. See **Fig. 1** . Remove wiring harness from retainer on transaxle and move to the side.
2. Pull connector off multifunction TR switch. See **Fig. 2** . Move selector lever to "P" position and remove selector lever cable from lever/selector shaft. Remove selector lever cable anchorage circlip and remove selector lever cable. For transaxles with clipped selector lever cable, release selector lever cable (1).

Remove cable (1) from support bracket (2). See **Fig. 3** .

3. Clamp off ATF cooler hoses with Hose Clamps (3094) and remove at ATF cooler. See **Fig. 4** . Install Support Bar (10-222 A) with Legs (10-222 A/1) and support engine/transaxle assembly in this position. See **Fig. 5** . Remove starter.
4. Remove bracket for power steering pressure hose. Disconnect front mount from engine carrier. Remove mount. Remove coolant expansion tank and lay to one side. Remove left engine mount. Remove upper engine/transaxle connecting bolts. Remove ATF oil pan protective plate.
5. Remove torque converter cover plate and nuts from torque converter. Disconnect drive axles at flanges. Raise right drive axle and secure out of the way. Remove left wheel. Turn steering to right lock. Mark installation position of ball joint bolts on left hand control arm and remove bolts.
6. On vehicles with Plus running gear, remove bolts (A) and loosen bolts (B). See **Fig. 6** . Swing ball joint outward and move left hand drive axle to one side. Remove drive axle with a star shaped joint.

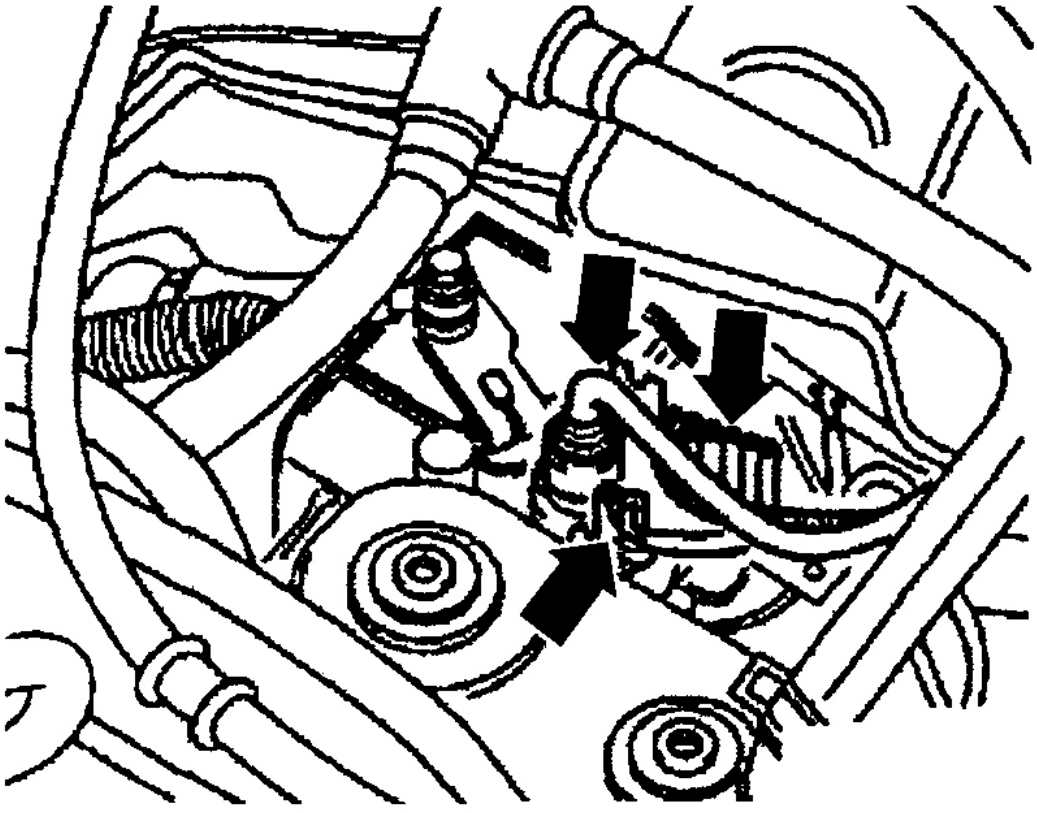

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Fig. 1: Locating Electrical Connections At Transaxle
Courtesy of VOLKSWAGEN UNITED STATES, INC.

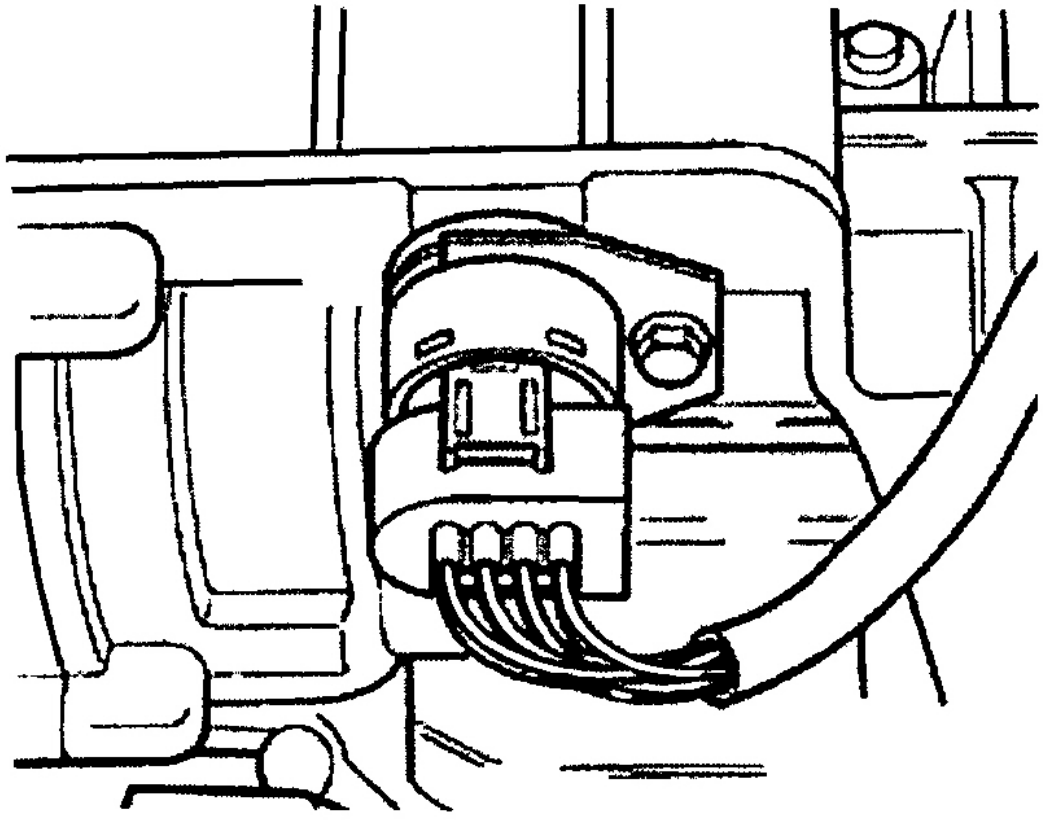

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Fig. 2: Identifying Multifunction TR Switch
Courtesy of VOLKSWAGEN UNITED STATES, INC.

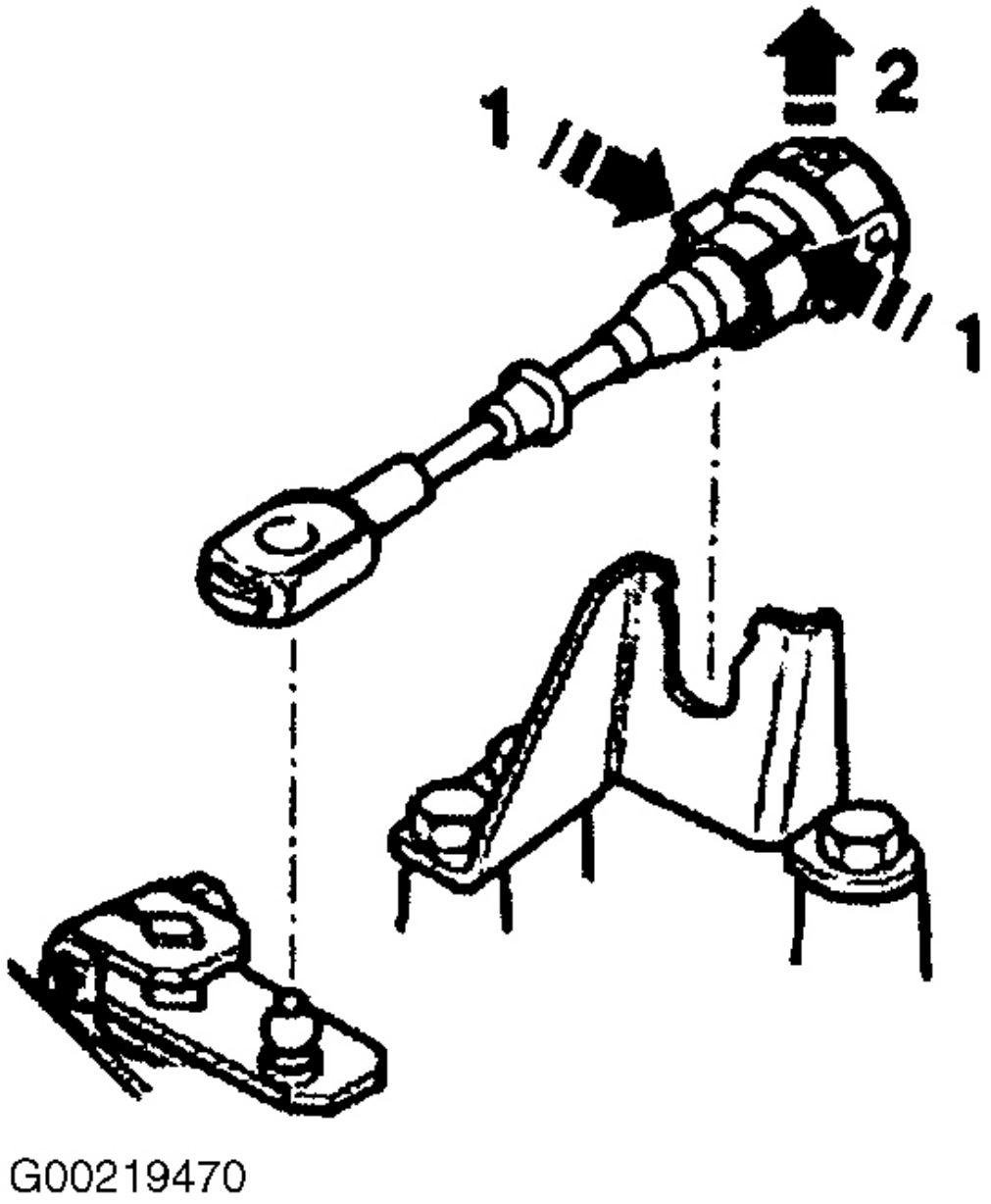

Fig. 3: Removing Selector Lever Cable From Support Bracket
Courtesy of VOLKSWAGEN UNITED STATES, INC.

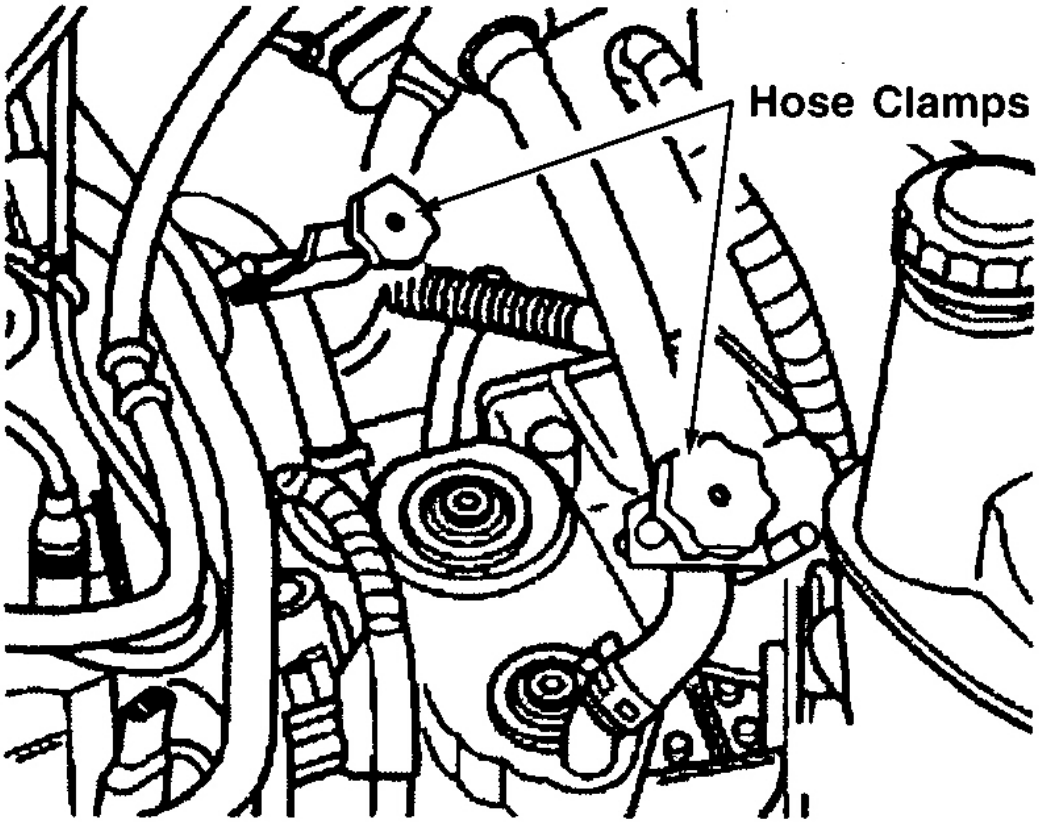

Fig. 4: Clamping Off ATF Cooler Hoses
Courtesy of VOLKSWAGEN UNITED STATES, INC.

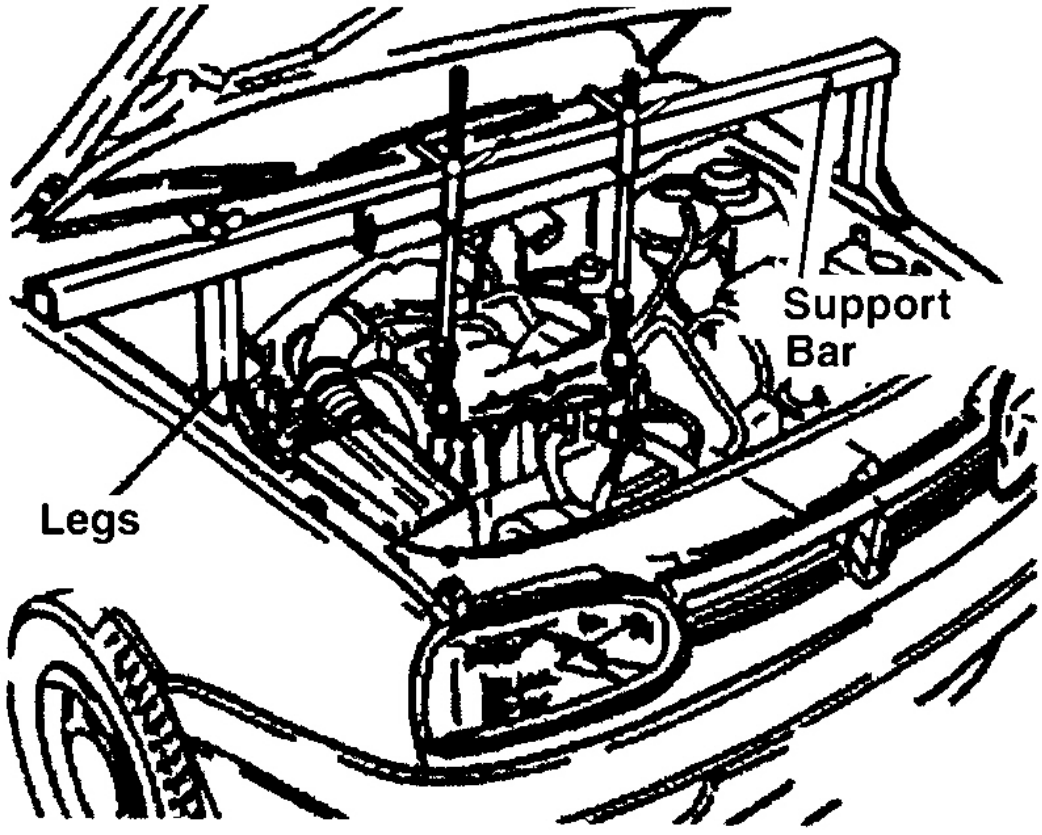

Fig. 5: Installing Support Bar & Legs
Courtesy of VOLKSWAGEN UNITED STATES, INC.

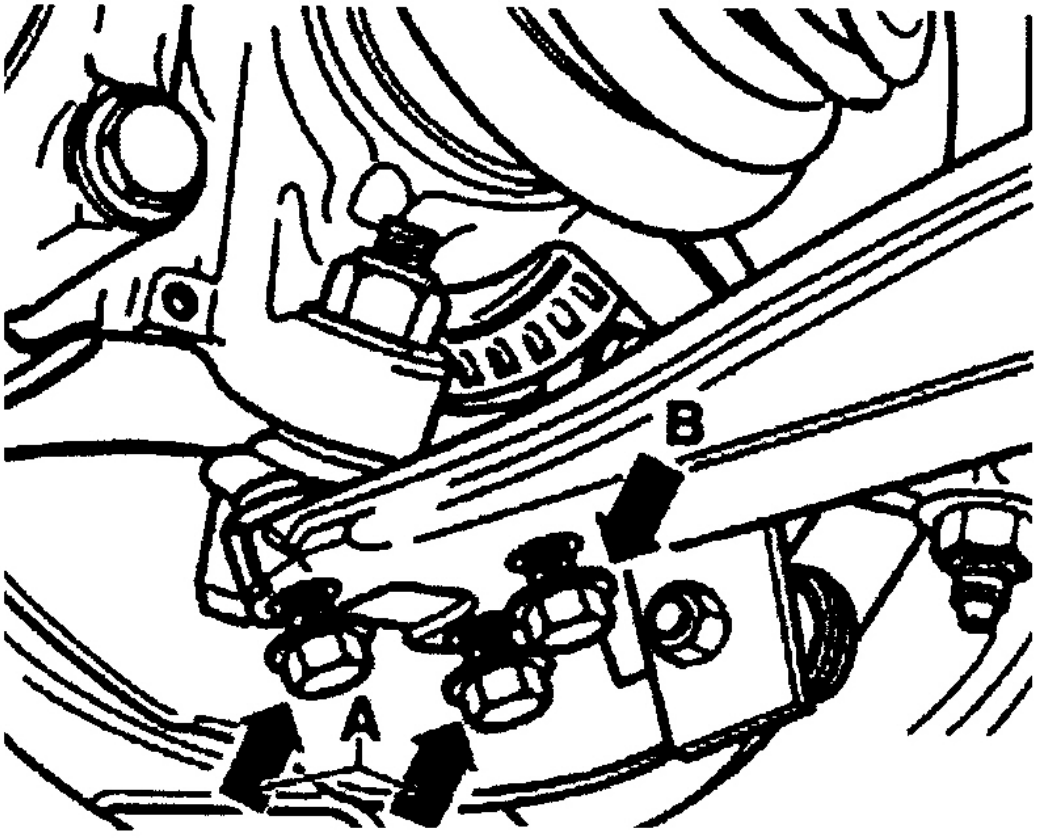

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Fig. 6: Removing Lower Ball Joint Bolts
Courtesy of VOLKSWAGEN UNITED STATES, INC.

7. On all models, set up Transaxle Support (3282). Transaxle Support (3282) is set up with Adjusting Plate (3282/2) for removing transaxle. The symbols on the adjusting plate indicate the mounts required. See **Fig. 7** . Move Transaxle Jack (VAG 1383 A) with Transaxle Support (3282) under transaxle and support. See **Fig. 8** .
8. Place safety support pin on oil pan and secure to transaxle housing (arrow). See **Fig. 9** . Remove lower engine/transaxle connecting bolts. Tilt engine and transaxle forward with Supporting Device (3300 A). See **Fig. 10** . Press transaxle off engine. When doing this, press torque converter out of drive plate. Press torque converter against ATF pump. Lower engine using support device spindle. Lower transaxle slightly.
9. Guide power steering pressure line past transaxle. Tilt transaxle using jack spindle and, while lowering, ensure cover (wheel housing side) is guided closely past wheel housing. Swivel transaxle and carefully lower transaxle. Ensure right joint flange does not contact Supporting Device (3300 A) and multifunction TR switch does not contact subframe. Secure torque converter to prevent it from falling out.

10. To install transaxle, reverse removal procedure. When installing the torque converter, ensure that both drive pins engage in the ATF pump inner wheel recesses. Before installing, ensure the dowel sleeves are correctly located. When installing transaxle, observe torque converter contact impression on drive plate. Replace selector cable anchorage locking washer. Check selector lever cable adjustment, and adjust if necessary. See **SERVICING - 01M & 01V** article. Tighten bolts and nuts to specification. See **TORQUE SPECIFICATIONS** .

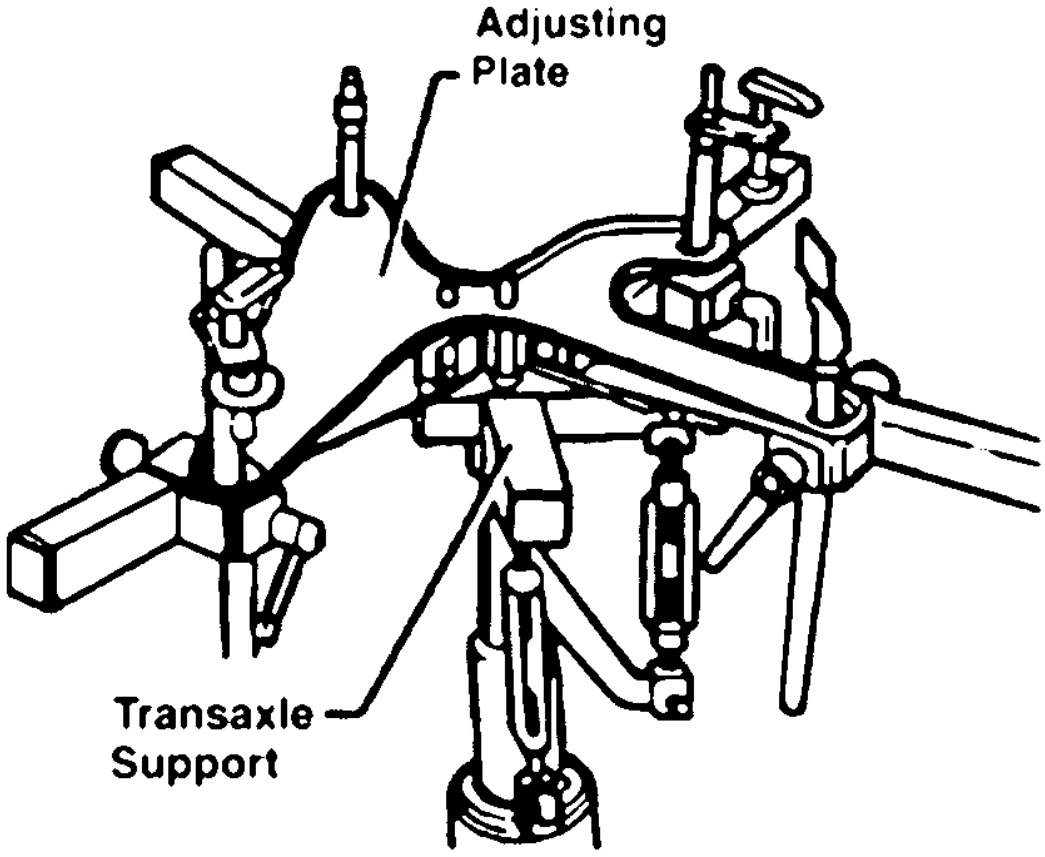

Fig. 7: Setting Up Transaxle Support & Adjusting Plate
Courtesy of VOLKSWAGEN UNITED STATES, INC.

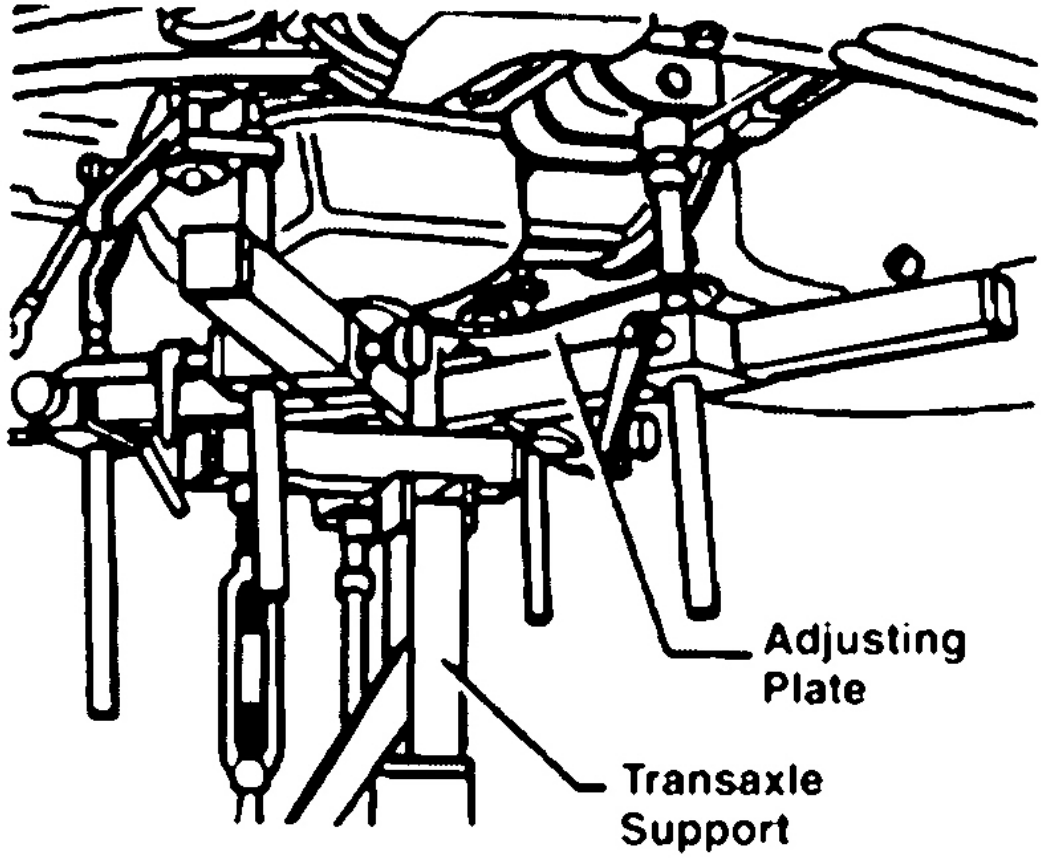

Fig. 8: Positioning Transaxle Support Under Transaxle
Courtesy of VOLKSWAGEN UNITED STATES, INC.

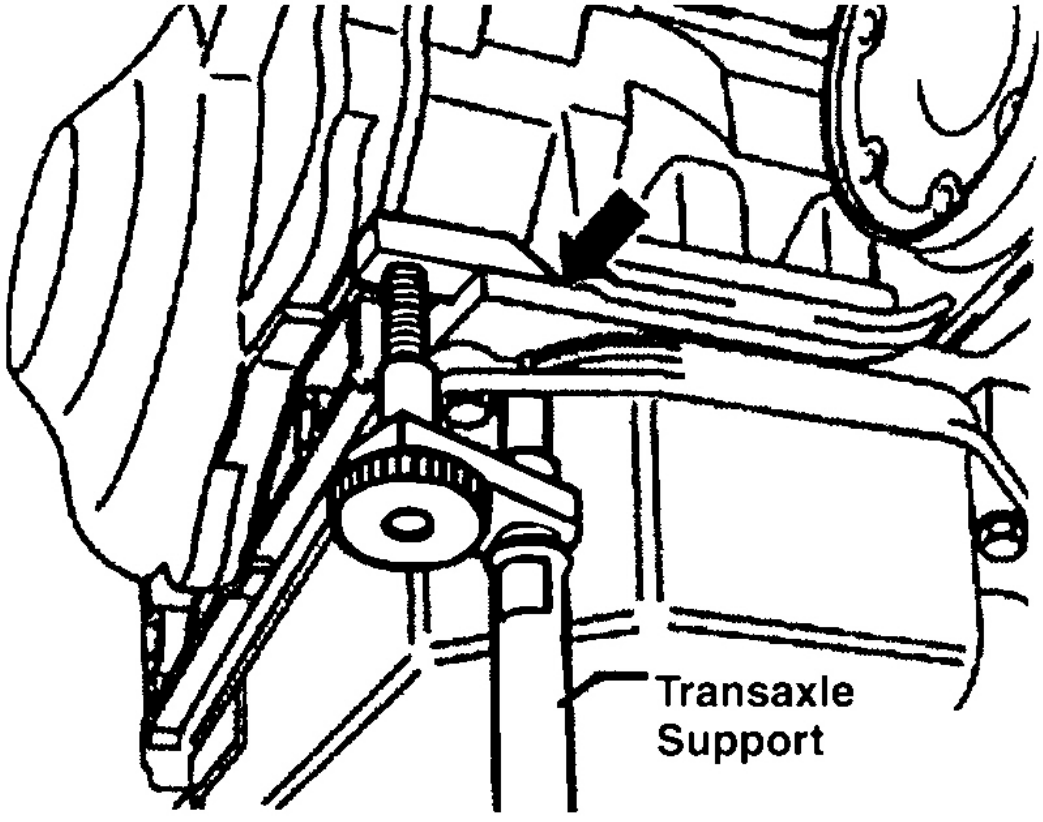

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Fig. 9: Placing Safety Support Pin On Oil Pan
Courtesy of VOLKSWAGEN UNITED STATES, INC.

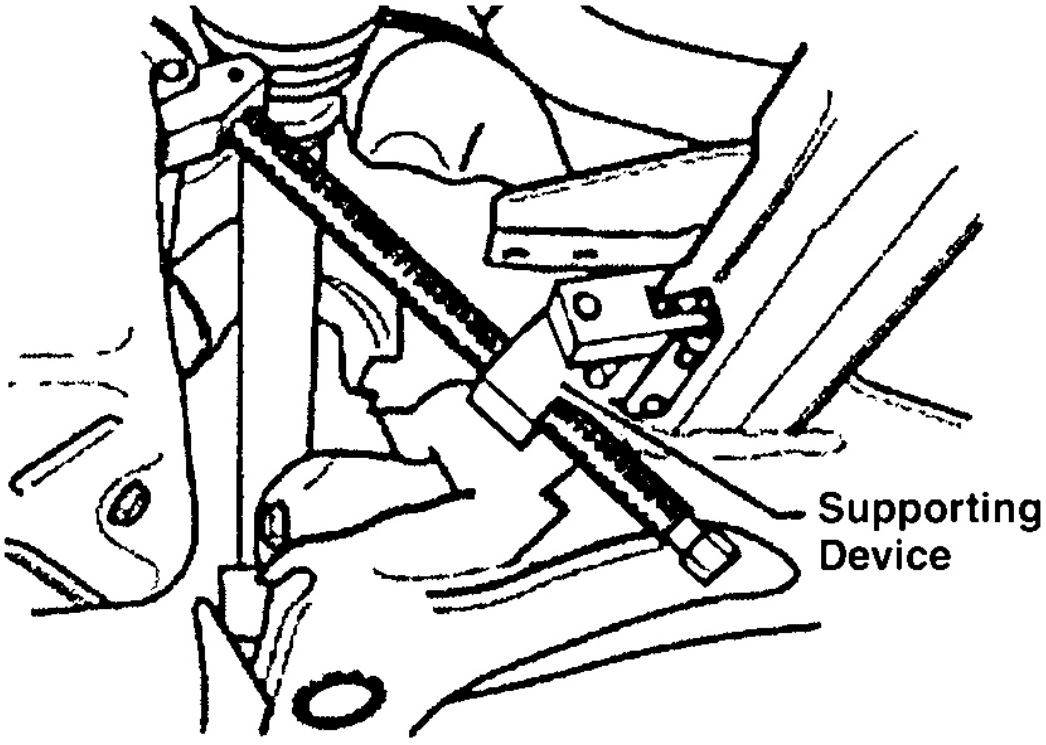

Fig. 10: Tilting Engine/Transaxle Assembly Forward Using Supporting Device
Courtesy of VOLKSWAGEN UNITED STATES, INC.

GOLF, GTI & JETTA

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Removal & Installation

1. Disconnect negative battery cable. Remove engine cover. Remove battery. Remove battery carrier. Pull intake hose (1) and connector (2) off mass air flow sensor. Pull off vacuum hose (3). Remove bolts (4 and 5). See **Fig. 11** . Remove air cleaner assembly. Disconnect speedometer connector at transaxle.
2. Remove electrical connections to the solenoid valves (1), vehicle speed sensor (2) multifunction TR switch (3), and transaxle vehicle speed sensor (4). See **Fig. 12** . There are 2 types of sensors. Connection is equipped with and without cable. Remove wiring harness from retainer on transaxle and place to one side. Remove bracket for power steering hose with retainer for wiring harness.
3. Place selector lever in "P" position and pry selector lever cable (1) off lever/selector shaft (4) with a screwdriver. Do not loosen bolt (2). Remove circlip (3) at selector lever cable support bracket and remove selector lever cable. See **Fig. 13** . Do not kink selector lever cable.
4. Disconnect battery ground cable (1) from upper engine/transaxle securing bolt. Disconnect electrical connections (3 and 4) on starter. Separate connector (2) and pull out of retainer. See **Fig. 14** . Remove wiring harness retainer on starter. Remove upper bolt at starter.
5. Clamp ATF cooler hoses with Hose Clamps (3094) and disconnect at ATF cooler. See **Fig. 15** . Seal off ATF cooler with clean plugs. Remove engine/transaxle upper securing bolts.
6. Install Support Bar (10-222 A) with Legs (10-222 A/1) and support engine/transaxle in this position. See **Fig. 16** . Remove left front wheel bolts. Raise and support vehicle. Remove left front wheel. Remove sound insulation tray (arrows). See **Fig. 17** .
7. Remove left sound insulation (arrows). See **Fig. 18** . Remove pipe between charge air cooler and exhaust turbocharger (if equipped). Remove right sound insulation. Remove ATF oil pan protective plate (arrows). See **Fig. 19** .

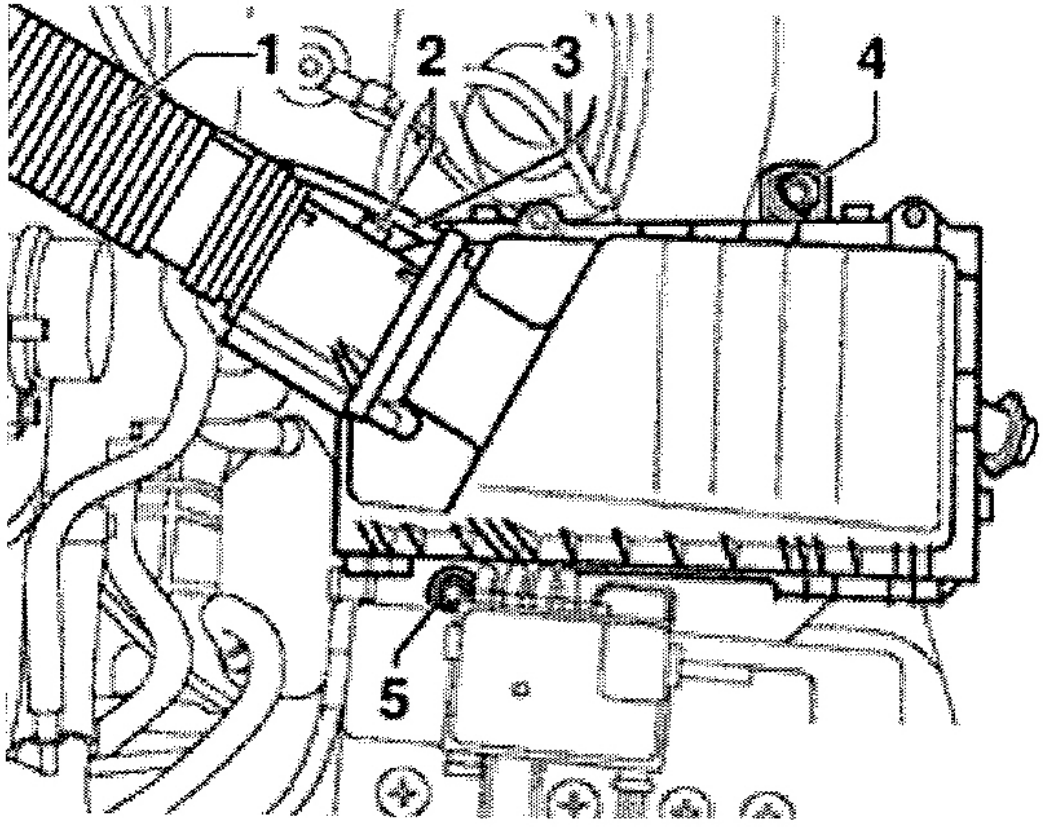

Fig. 11: Identifying Air Cleaner Assembly
Courtesy of VOLKSWAGEN UNITED STATES, INC.

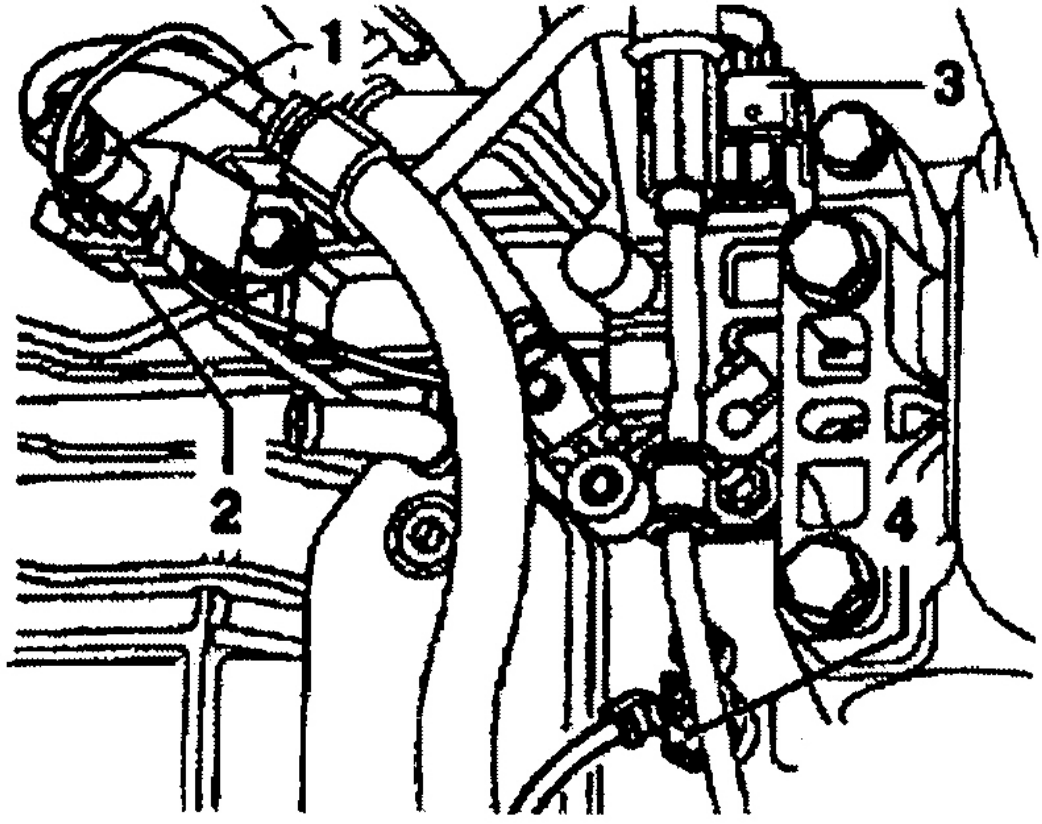

Fig. 12: Locating Electrical Connections At Transaxle
Courtesy of VOLKSWAGEN UNITED STATES, INC.

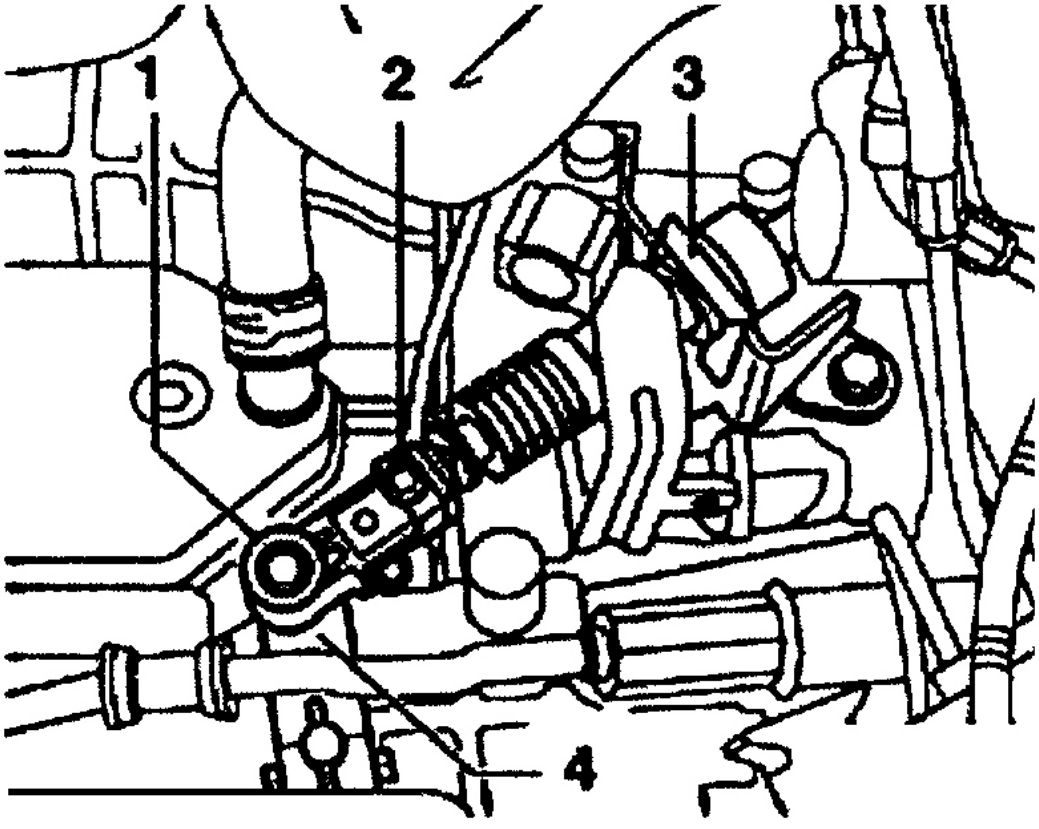

Fig. 13: Removing Selector Lever Cable From Selector Shaft
Courtesy of VOLKSWAGEN UNITED STATES, INC.

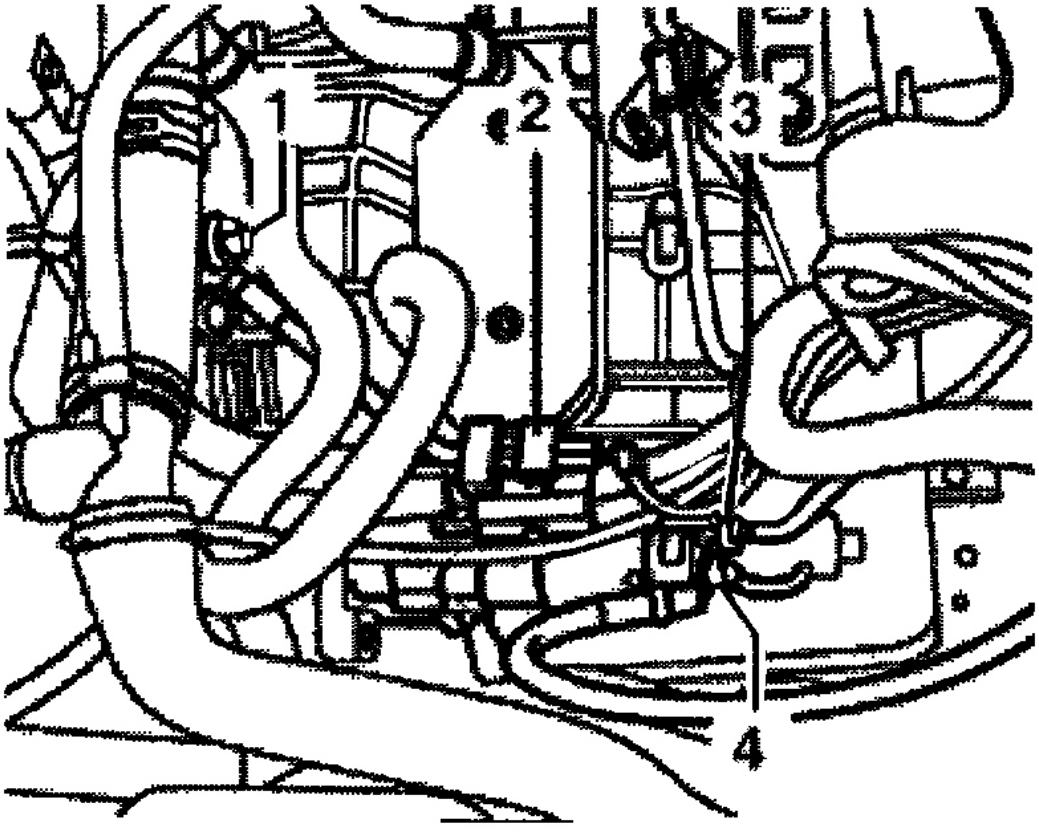

Fig. 14: Removing Ground Cable & Disconnecting Electrical Connections At Starter
Courtesy of VOLKSWAGEN UNITED STATES, INC.

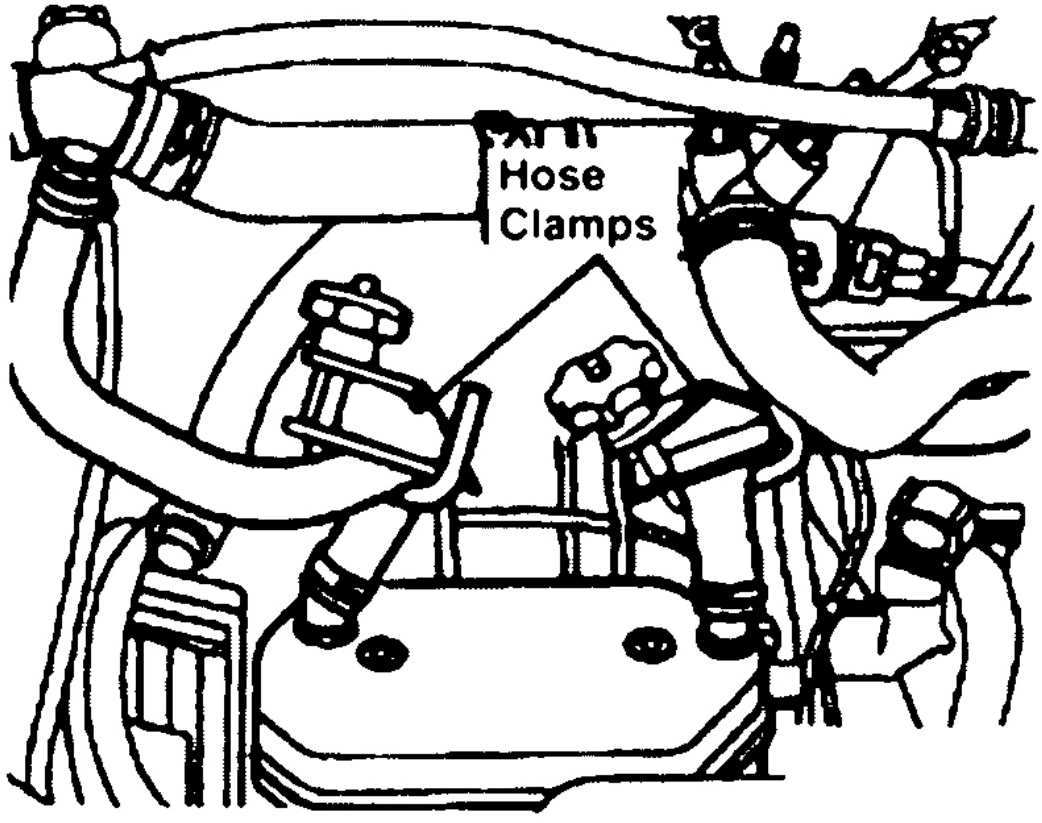

Fig. 15: Clamping Off ATF Cooler Hoses
Courtesy of VOLKSWAGEN UNITED STATES, INC.

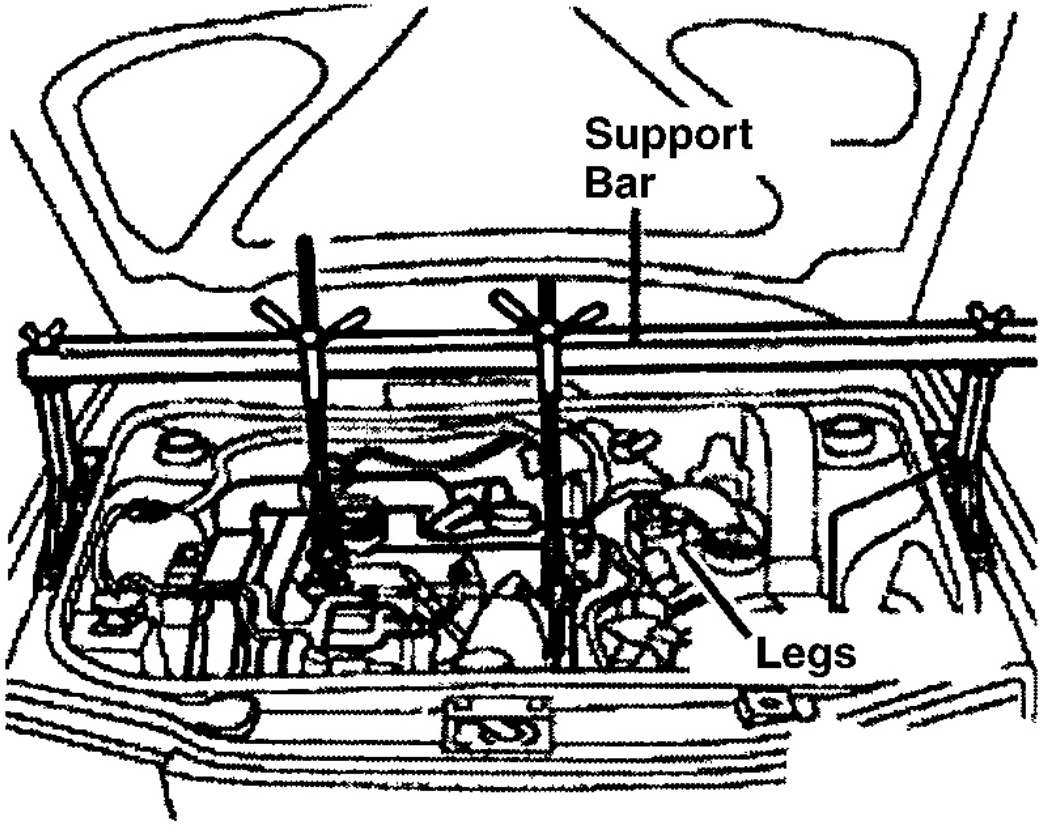

Fig. 16: Assembling Support Bar & Legs
Courtesy of VOLKSWAGEN UNITED STATES, INC.

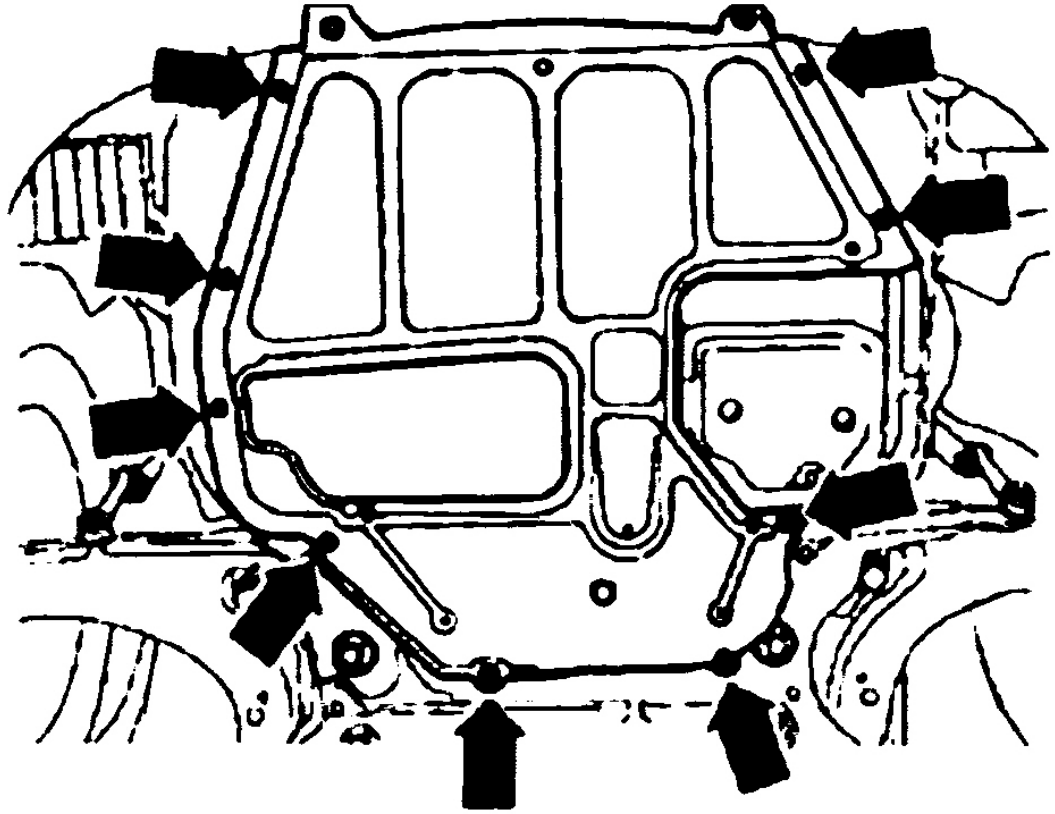

Fig. 17: Removing & Installing Sound Insulation Tray
Courtesy of VOLKSWAGEN UNITED STATES, INC.

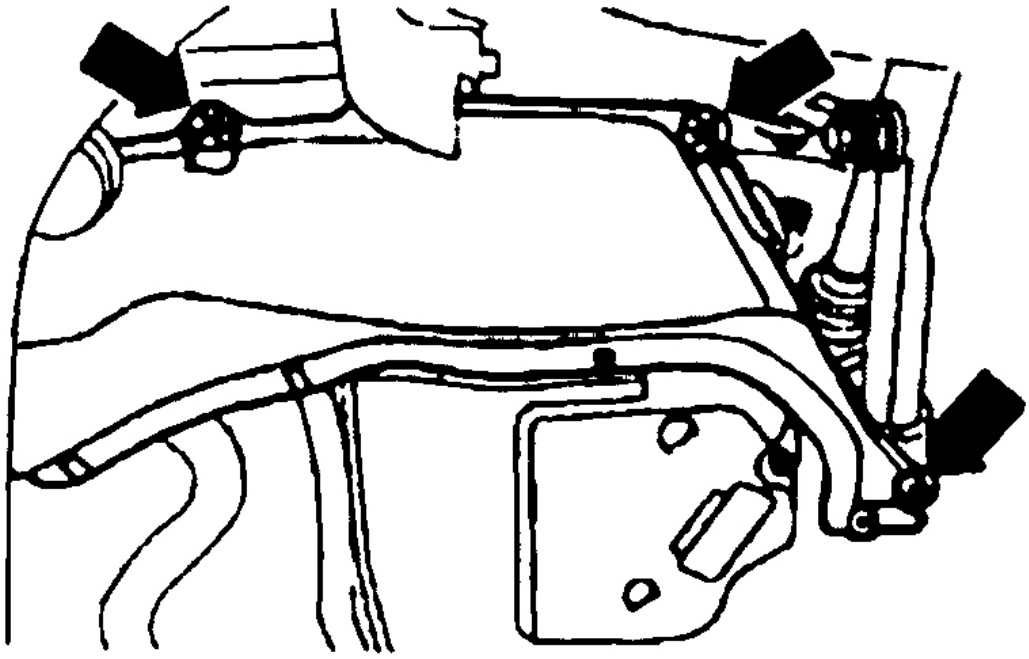

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Fig. 18: Removing & Installing Left Sound Insulation
Courtesy of VOLKSWAGEN UNITED STATES, INC.

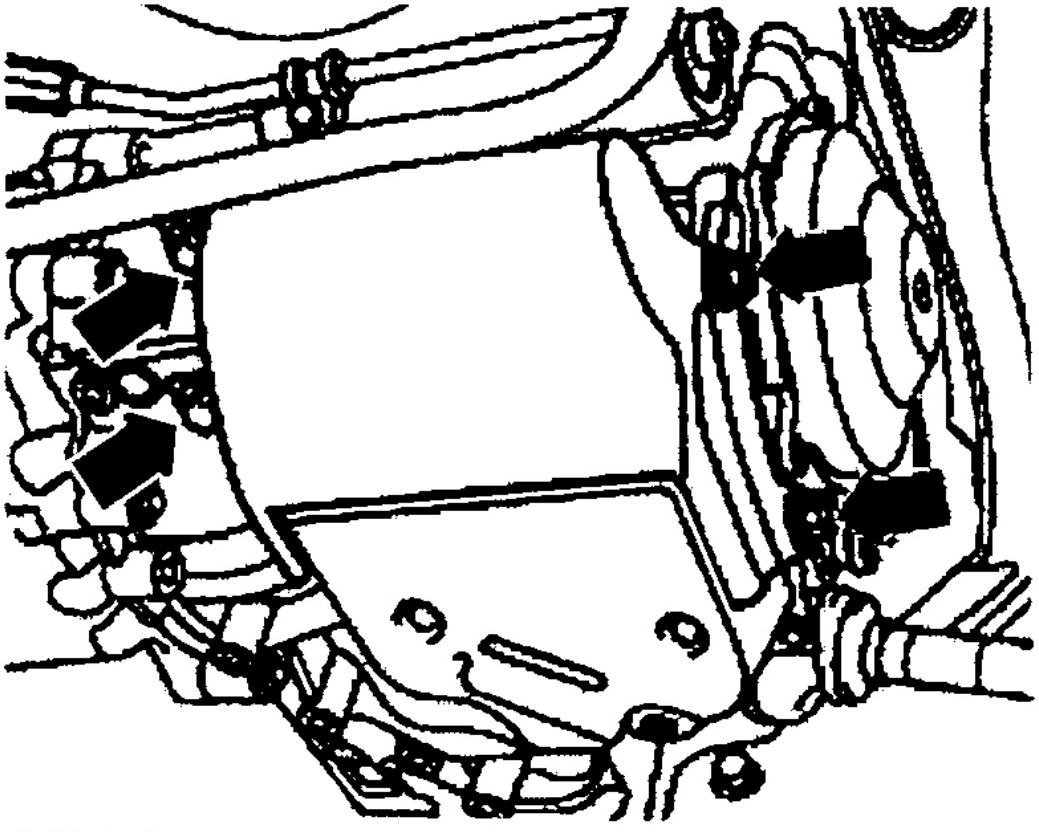

Fig. 19: Removing ATF Oil Pan Protective Plate
Courtesy of VOLKSWAGEN UNITED STATES, INC.

8. Remove bracket (1) for power steering pressure line from lower starter bolt (arrow). See **Fig. 20** . Remove lower bolt at starter. Remove starter (2). Remove right hand inner constant velocity joint protective cover from engine, if installed. Disconnect drive axles at transaxle flanges. Raise right drive axle and secure to the side. Remove pendulum support (arrows). See **Fig. 21** .
9. Unclip cap for torque converter nut cover. Remove nut (arrow) from torque converter using Special Socket (V 175). See **Fig. 22** . Turn crankshaft 120 degrees further for each nut. Turn steering to left lock. Mark installation position of ball joint bolts on left hand control arm and remove 3 bolts.
10. Disconnect left coupling rod (1) from control arm and turn rod upward. Swing wheel bearing housing outward. Guide left drive axle (2) out between subframe and transaxle. Lift drive axle and secure to suspension strut with wire. See **Fig. 23** .
11. Remove left assembly mounting (2) hex bolts (arrows) from left mount (1). See **Fig. 24** . Carefully tilt engine and transaxle by lowering left hand spindle about 2.36" (60 mm) on Support Bar (10-222 A).
12.

NOTE: In the following step, to secure support rail to subframe, a NEW hole must be drilled in support rail. Drill a .335" (8.50 mm) diameter hole (arrow) at recessed section of support rail. See Fig. 26 .

Remove left mount (1) from transaxle (arrows). See **Fig. 25** . Separate exhaust system at down pipe. Using 2 bolts (M 8 x 25), bolt Support Rail (VW 457/1) to both pendulum support securing holes (A) on subframe. Insert spacers totalling .24" (6 mm) between subframe and Support Rail (VW 457/1). Install Support Device (3300 A) and tighten with bolt (B). See **Fig. 27** .

13. Repair Manual, Engine Mechanical, Repair Group 26; Removing and installing parts of exhaust system.
14. Tilt engine and transaxle forward with Support Device (3300 A). Set up Transaxle Support (3282). Transaxle Support (3282) must be set up with Adjusting Plate (3282/2) for removing transaxle. See **Fig. 7** . The symbols on the adjusting plate indicate the supports required. Move Transaxle Jack (VAG 1383 A) with Transaxle Support (3282) under transaxle and support transaxle. See **Fig. 8** .
15. Place safety support pin on oil pan and secure to transaxle housing (arrow). See **Fig. 9** . On vehicles with triple roller drive axle, turn transaxle flange to right so that flat (arrow) is vertical. See **Fig. 28** . Remove lower engine/transaxle connecting bolt. Press transaxle off engine, while pressing torque converter out of drive plate. Press torque converter against ATF pump.
16. Lower transaxle slightly. Guide power steering pressure line past transaxle. Tilt transaxle using transaxle jack spindle, and while lowering, ensure cover (wheel housing side) is guided closely past wheel housing. Swivel transaxle and carefully lower transaxle. Ensure that the right joint flange does not contact the engine or the Support Device (3300 A), and that the multifunction TR switch does not contact the subframe. Secure torque converter to prevent it from falling out.
17. To install transaxle, reverse removal procedure. When installing the torque converter, ensure that both drive pins engage in the ATF pump inner wheel recesses. Before installing, ensure that dowel sleeves are correctly located. When installing transaxle, observe torque converter contact impression on drive plate. Replace selector cable anchorage locking washer. Check selector lever cable adjustment, and adjust if necessary. Check and top off ATF level. See **SERVICING - 01M & 01V** article. See **TORQUE SPECIFICATIONS** .

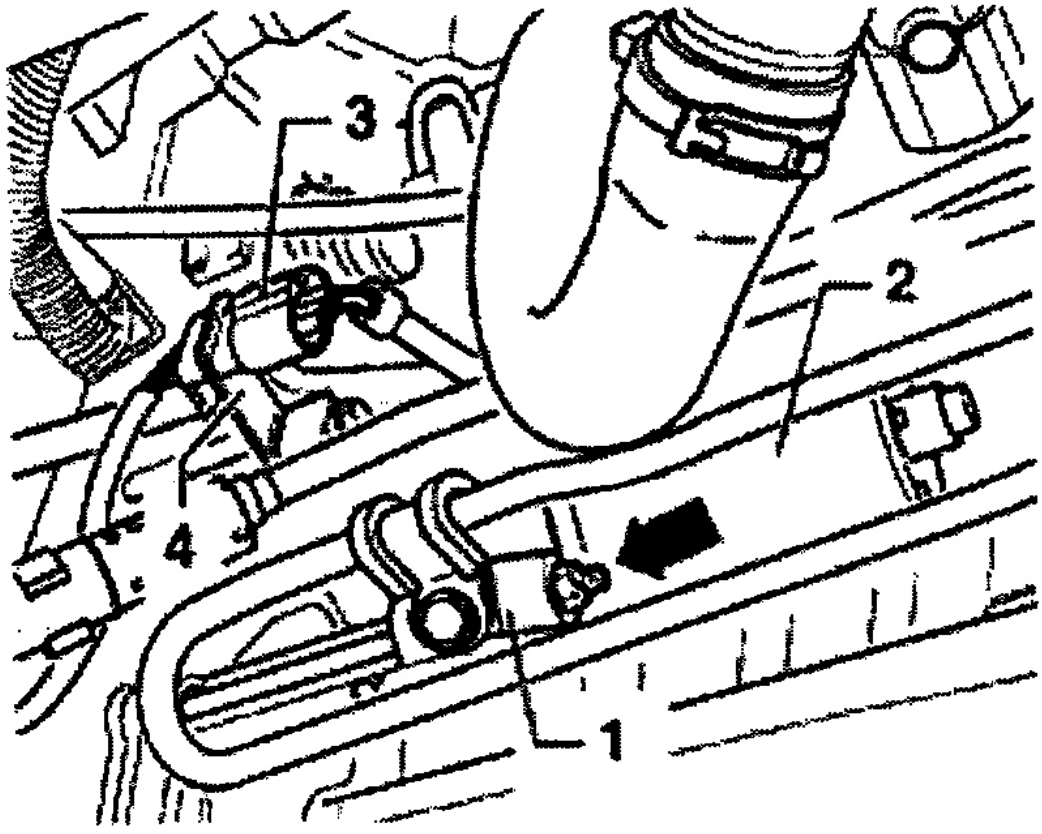

Fig. 20: Removing Bracket & Starter
Courtesy of VOLKSWAGEN UNITED STATES, INC.

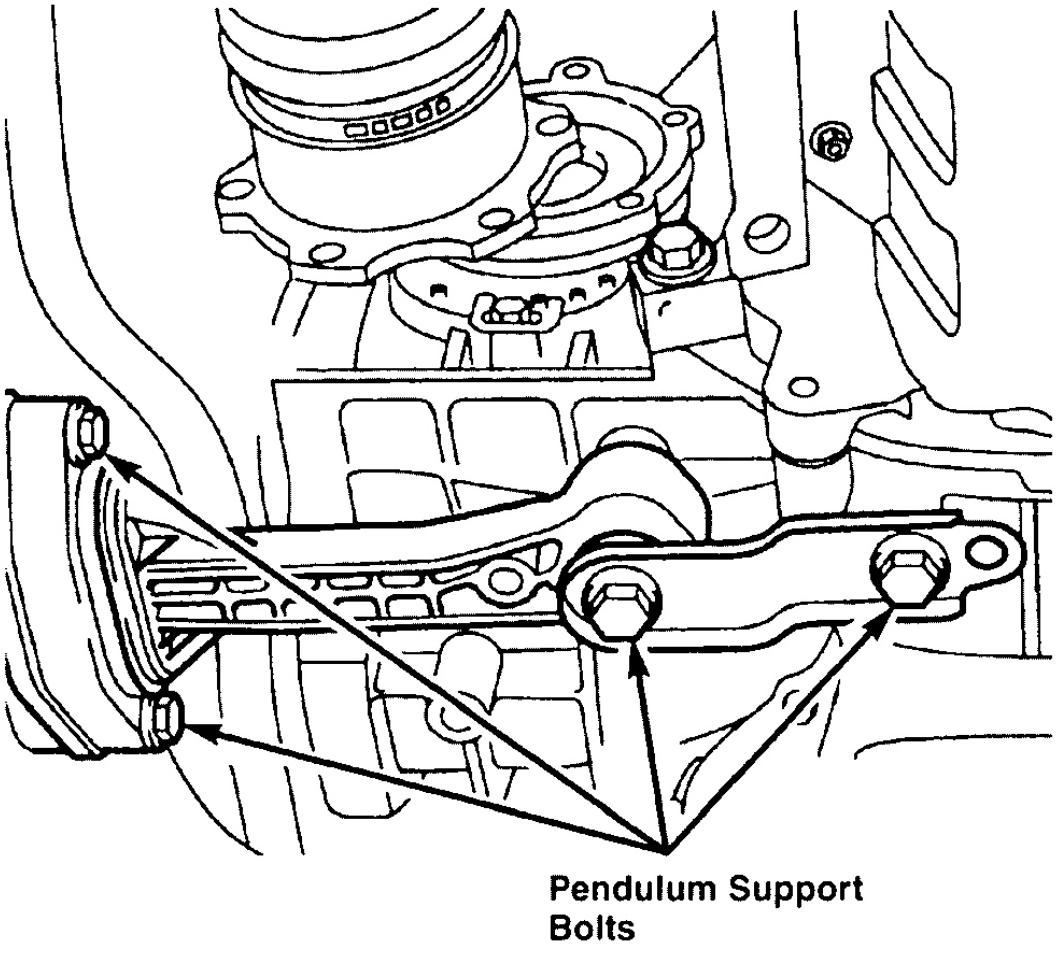

Fig. 21: Removing Pendulum Support
Courtesy of VOLKSWAGEN UNITED STATES, INC.

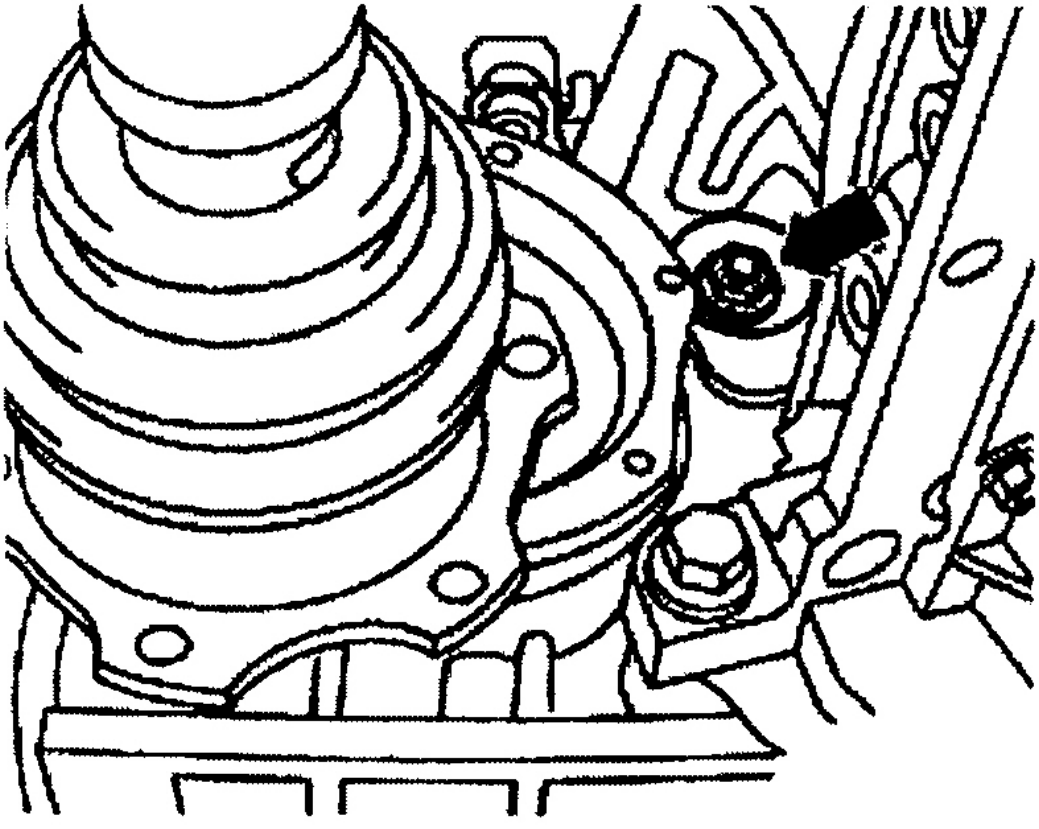

Fig. 22: Identifying Torque Converter Nut
Courtesy of VOLKSWAGEN UNITED STATES, INC.

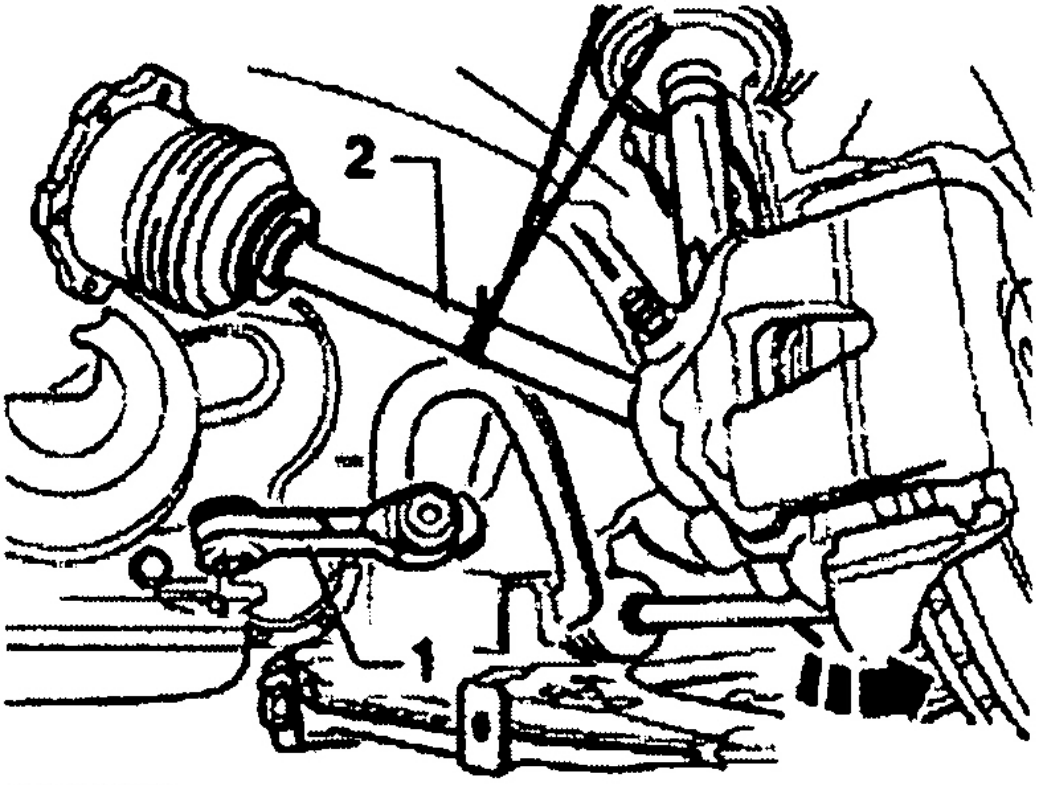

Fig. 23: Positioning Left Coupling Rod & Left Hand Drive Axle
Courtesy of VOLKSWAGEN UNITED STATES, INC.

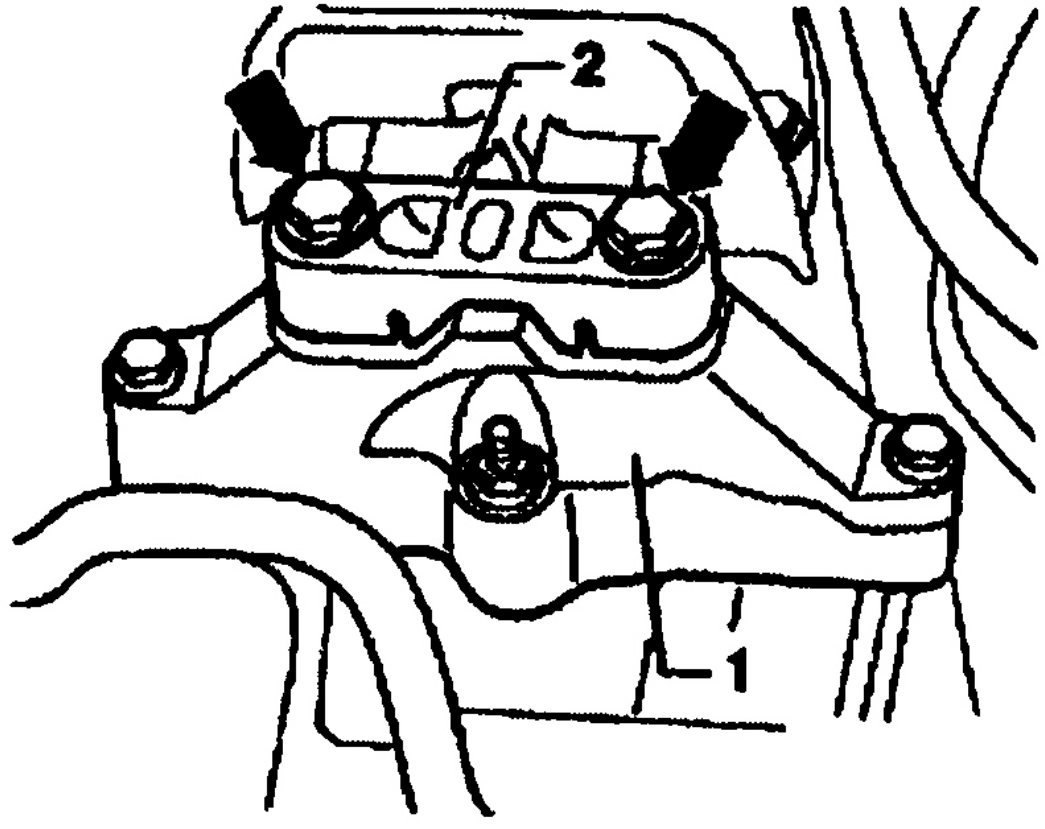

Fig. 24: Removing & Installing Left Assembly Mount Bolts
Courtesy of VOLKSWAGEN UNITED STATES, INC.

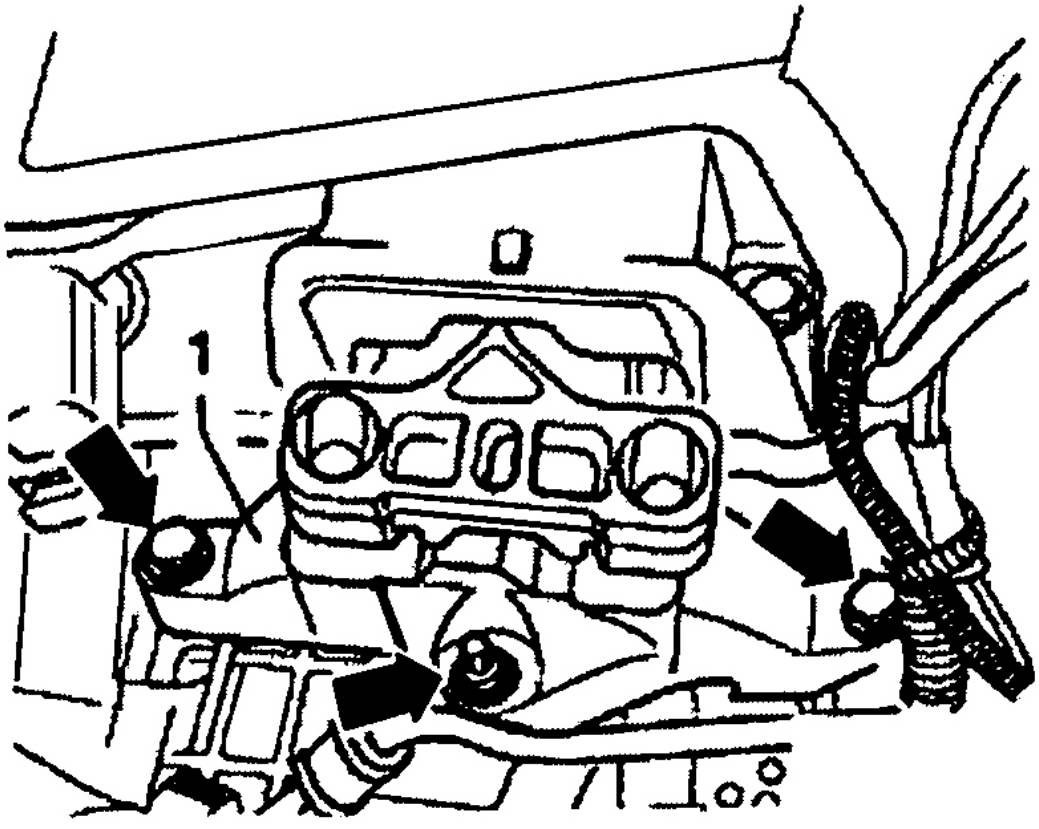

Fig. 25: Removing & Installing Left Mount From Transaxle
Courtesy of VOLKSWAGEN UNITED STATES, INC.

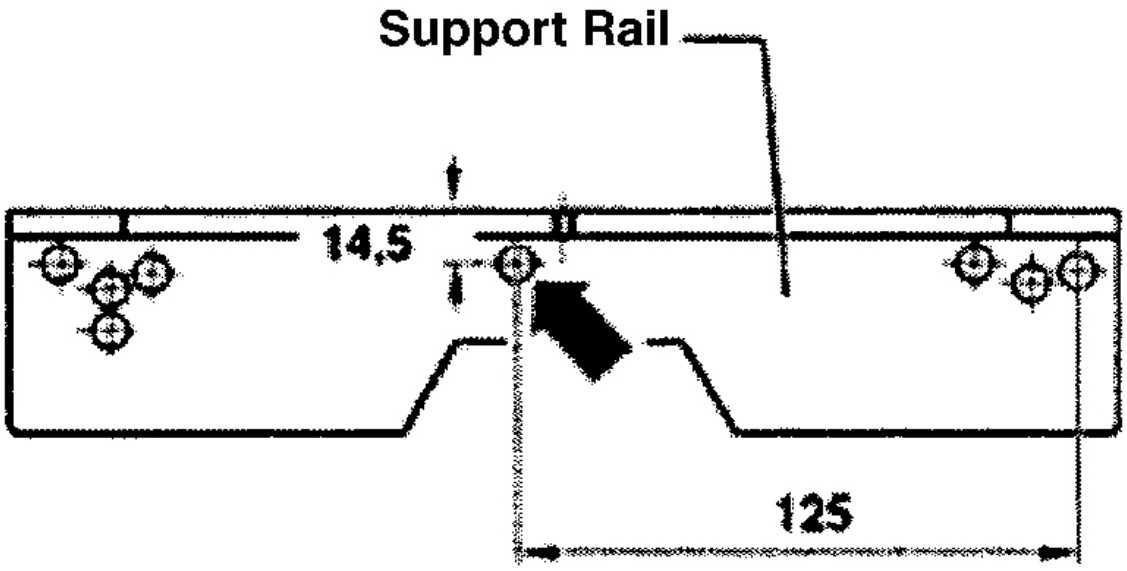

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Fig. 26: Drilling Hole In Support Rail (VW 457/1)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

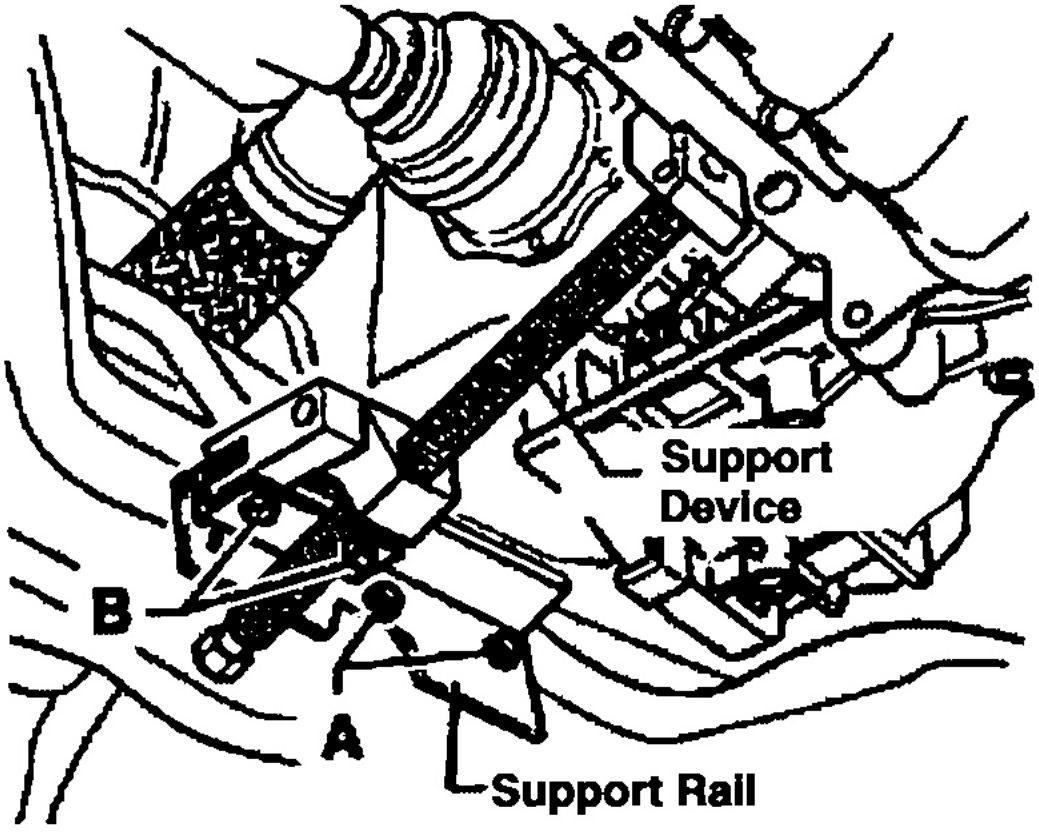

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Fig. 27: Installing Support Rail To Subframe
Courtesy of VOLKSWAGEN UNITED STATES, INC.

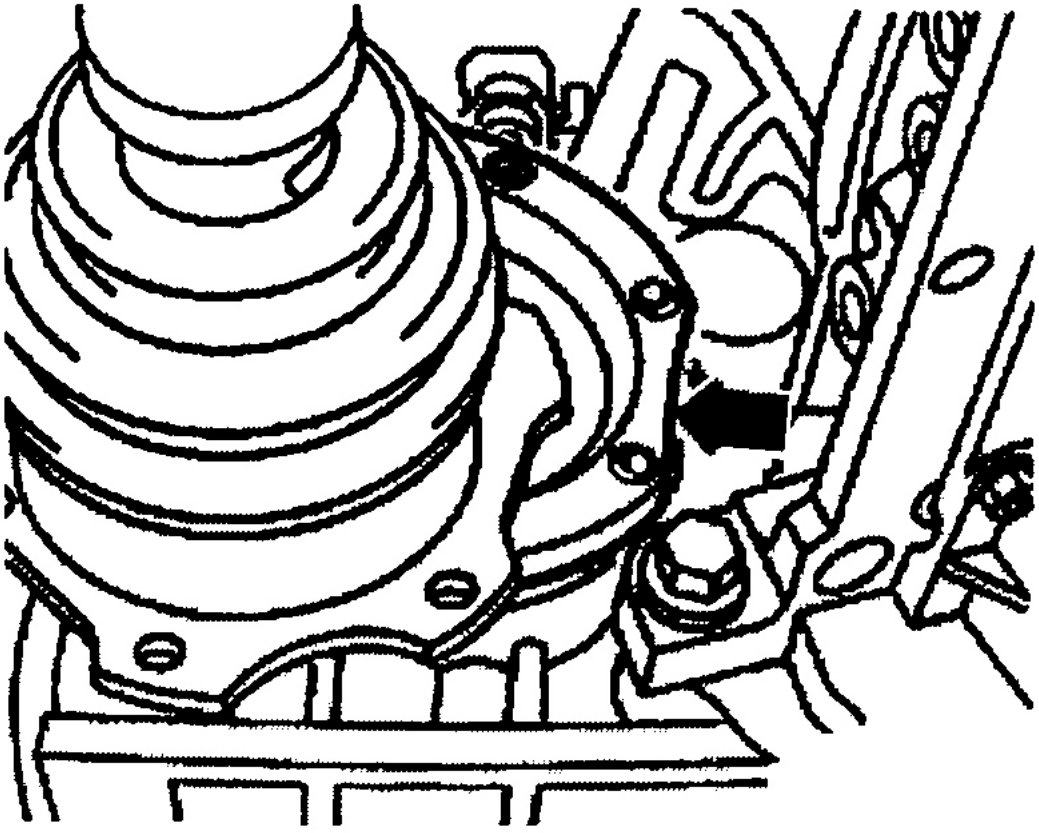

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Fig. 28: Positioning Right Hand Drive Flange
Courtesy of VOLKSWAGEN UNITED STATES, INC.

NEW BEETLE

NOTE: In the following procedures, letters and numbers in parenthesis are shown in illustrations.

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Removal & Installation

1. Remove cover from engine. With ignition switch turned off, disconnect negative battery cable. Remove power steering reservoir from battery carrier. Do not loosen hoses. Secure power steering reservoir to lock carrier. Remove battery. Remove battery carrier.
2. Pull intake hose (1) and connector (2) off mass air flow sensor. Remove bolts (3, 4 and 5). See **Fig. 29** . Remove complete air cleaner. Disconnect connector from speedometer sensor.
3. Remove electrical connections for solenoid valves (1), vehicle speed sensor (2), multifunction TR switch (3) and transaxle vehicle speed sensor (4) at transaxle. See **Fig. 12** . Unclip wiring harness from retainer on transaxle and place to one side. Remove bracket for power steering pressure lines/hoses, with retainer for wiring harness, from transaxle.
4. Position selector lever in "P" position and press selector lever cable (1) off selector shaft lever (2) with a screwdriver. See **Fig. 30** . Remove circlip (3) at selector lever cable support bracket and remove selector lever cable. Do not kink selector lever cable.
5. On vehicles with 2.0L engine, unscrew sensor (1) from speedometer drive. Remove bolt (2). Remove heat shield (3) from engine exhaust manifold. See **Fig. 31** . On all models, remove ground cable (1) from upper engine/transaxle securing bolt. Disconnect electrical connections (3) and (4) on starter. Separate connector (2) and pull out of retainer. See **Fig. 14** . Remove wiring harness retainer on starter. Remove upper bolt at starter.
6. Clamp off ATF cooler hoses with Hose Clamps (3094) and disconnect at ATF cooler. See **Fig. 15** . Seal off ATF cooler with clean plugs. Remove upper engine/transaxle securing bolts. Assemble Support Device (10-222 A) with Adapters (10-222 A/8). See **Fig. 32** . Do not seat the Adapter (10-222 A/8) on the securing bolts for the front end/fender. Support weight of engine/transaxle assembly on support device spindles. Remove left front wheel bolts. Raise and support vehicle. Remove left front wheel.
7. Remove sound insulation tray (arrows). See **Fig. 17** . Remove left sound insulation (arrows). See **Fig. 18** . Remove charge air pipe between charge air cooler and exhaust gas turbocharger (if equipped). Remove right sound insulation.
8. Remove ATF oil pan protective plate (arrows). See **Fig. 19** . Remove power steering pressure lines/hoses from starter and transaxle. Remove lower bolt at starter. Remove starter. Remove right hand inner constant velocity joint protective cover from engine (if installed). Disconnect drive axles at transaxle flanges. Raise right drive axle and secure out of the way.
9. Remove pendulum support (arrows). See **Fig. 21** . Remove additional radiator fan on right hand side of vehicle (if part of original equipment). Unclip cap for torque converter nut cover. Remove nut (arrow) from torque converter using Special Socket (V 175). See **Fig. 22** . Turn crankshaft 120 degrees further for each nut. Turn steering to left lock. Mark installation position of ball joint bolts on left hand control arm

and remove 3 bolts.

10. Disconnect left coupling rod (1) from control arm and turn rod upward. Swing wheel bearing housing outward. Guide left hand drive axle (2) out between assembly carrier and transaxle. See **Fig. 23** . Lift drive axle and secure to suspension strut with wire. Disconnect exhaust system after front exhaust pipe at double clamp. Remove front exhaust system supports from assembly carrier, if necessary.
11. Remove left assembly mounting (2) hex bolts (arrows) from left mount (1). See **Fig. 24** . Carefully tilt engine and transaxle by lowering left hand support device spindle about 2.36" (60 mm) on Support Device (10-222 A).
12. **NOTE: In the following step, to secure support rail to subframe, a NEW hole must be drilled in support rail. Drill a .335" (8.50 mm) diameter hole (arrow) at recessed section of support rail. See Fig. 26 .**

    Remove left mount (1) from transaxle (arrows). See **Fig. 25** . Using 2 bolts (M 8 x 25), bolt Support Rail (VW 457/1) to both pendulum support securing holes (A) on subframe. Insert spacers totaling .24" (6 mm) between subframe and Support Rail (VW 457/1). Install Support Device (3300 A) and tighten with bolt (B). See **Fig. 27** .
13. Tilt engine and transaxle forward with Support Device (3300 A). Set up Transaxle Support (3282). Transaxle Support (3282) is set up with the Adjusting Plate (3282/2) for removing transaxle. See **Fig. 7** . The symbols on the adjusting plate indicate the supports required. Move Transaxle Jack (VAG 1383 A) with Transaxle Support (3282) underneath and support transaxle. See **Fig. 8** .
14. Place safety support pin on oil pan and secure to transaxle housing (arrow). See **Fig. 9** . Turn right hand drive flange so that flattened side (arrow) is in a vertical position. See **Fig. 28** . Remove lower engine/transaxle connecting bolts. Press transaxle off engine while pressing torque converter out of drive plate. Press torque converter against ATF pump.
15. Lower transaxle slightly. While lowering, guide power steering pressure line past transaxle. Swivel transaxle and carefully lower transaxle, guiding right hand drive flange past engine and Support Device (3300 A). Ensure that multifunction TR switch does not contact assembly carrier. Secure torque converter to prevent it from falling out.
16. To install transaxle, reverse removal procedure. When installing the torque converter, ensure that both drive pins engage in the ATF pump inner wheel recesses. Before installing, ensure that dowel sleeves are correctly located. When installing transaxle, observe torque converter contact impression on drive plate.
17. Replace selector cable anchorage locking washer. Check selector lever cable adjustment, and adjust if necessary. Check and top off ATF level. See **SERVICING - 01M & 01V** article. See **TORQUE SPECIFICATIONS** .

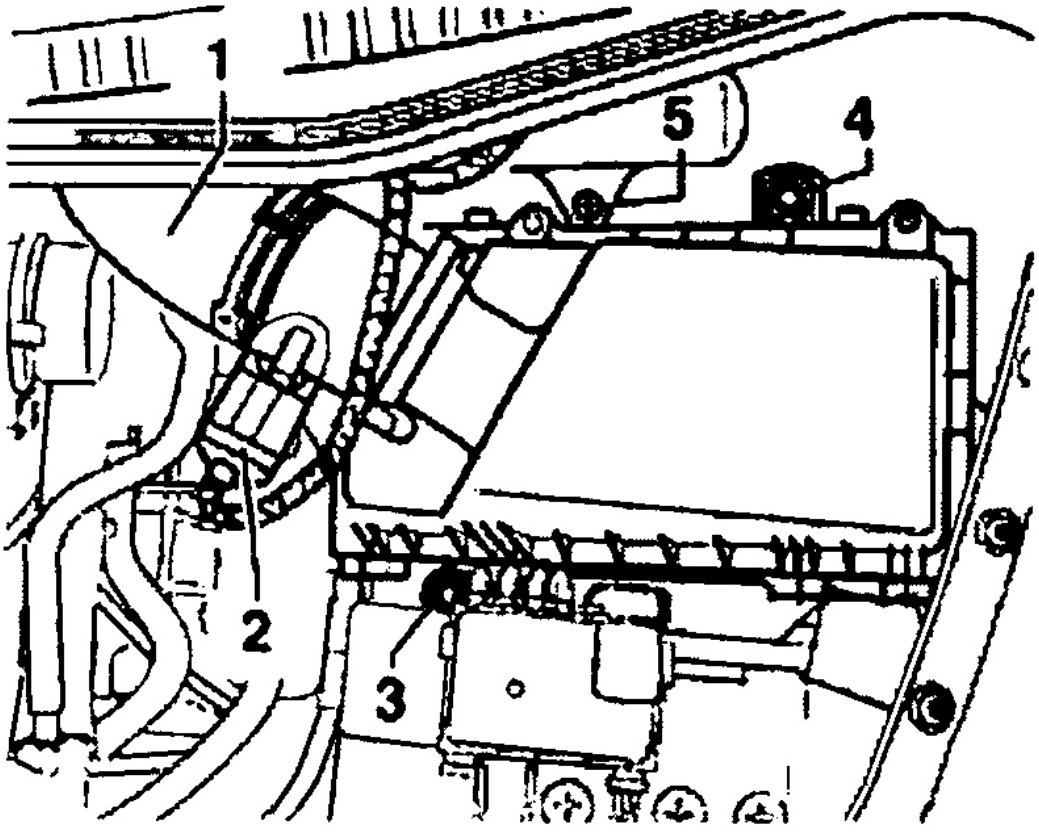

Fig. 29: Removing Intake Hose, Connector & Bolts
Courtesy of VOLKSWAGEN UNITED STATES, INC.

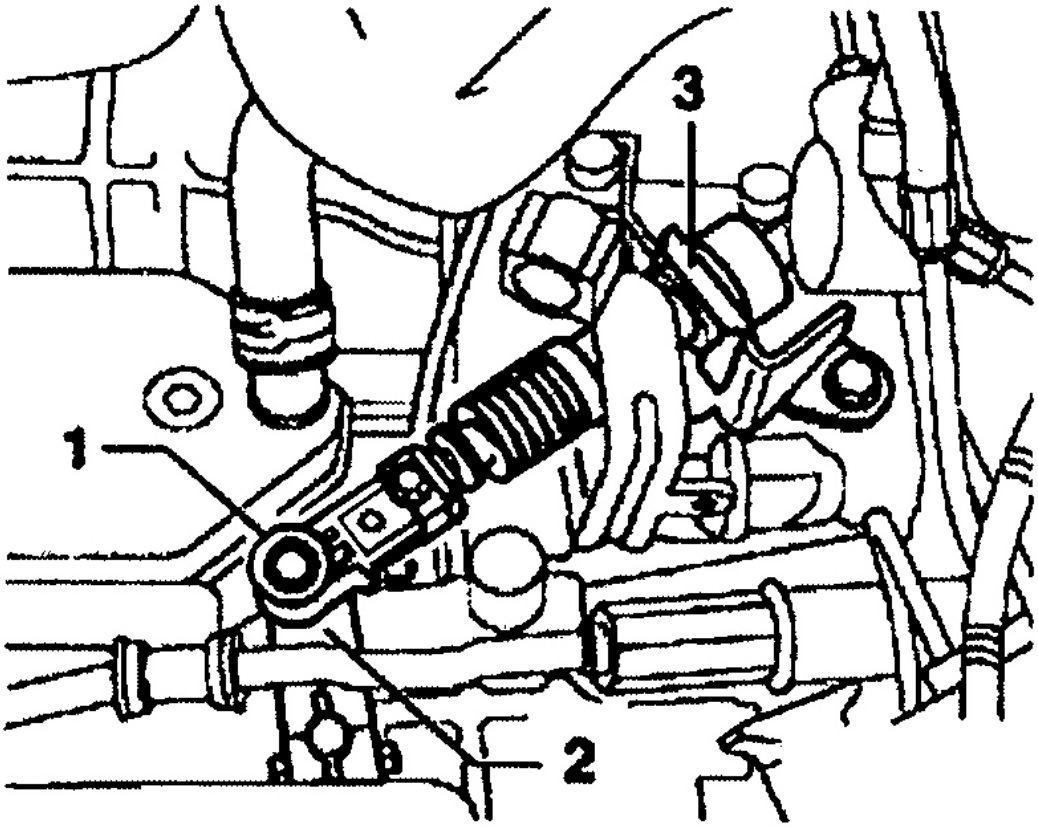

Fig. 30: Pressing Selector Lever Cable Off Selector Shaft Lever
Courtesy of VOLKSWAGEN UNITED STATES, INC.

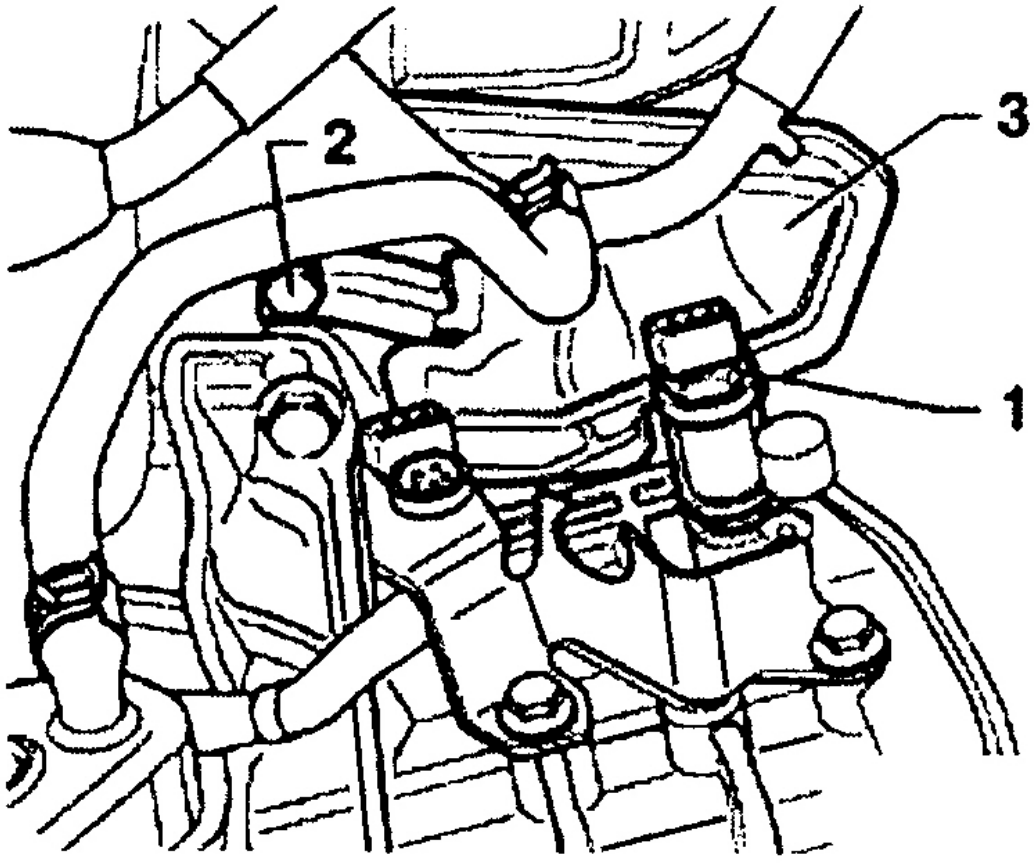

Fig. 31: Unscrewing Sensor, Removing Bolt & Heat Shield
Courtesy of VOLKSWAGEN UNITED STATES, INC.

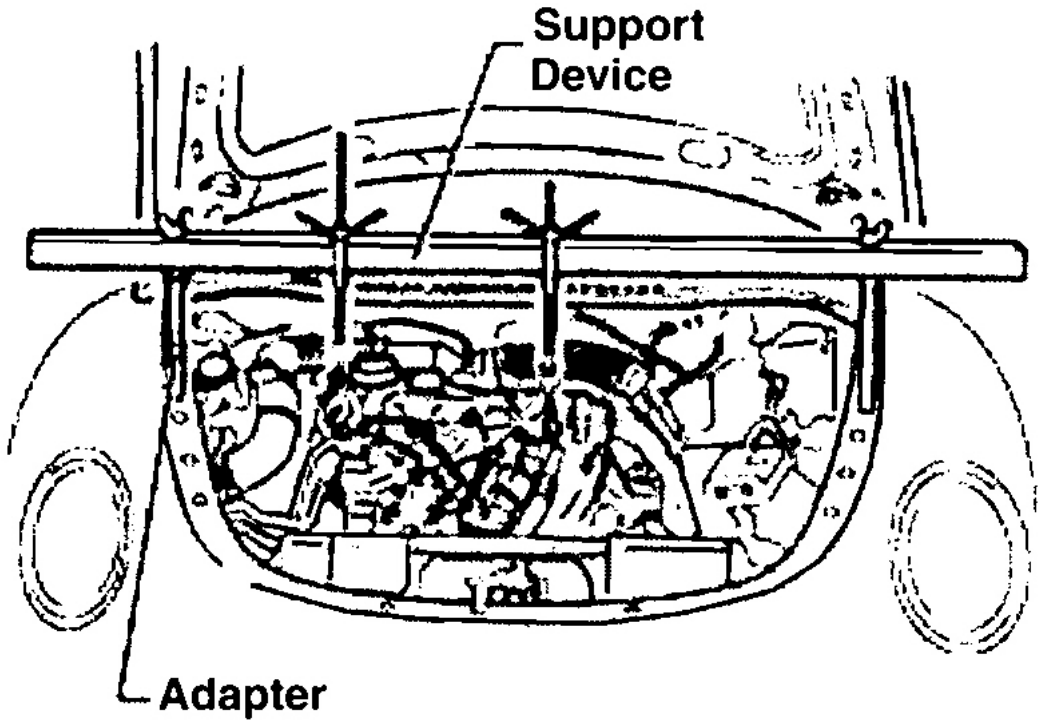

Fig. 32: Installing Support Device & Adapters To Vehicle
Courtesy of VOLKSWAGEN UNITED STATES, INC.

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS

Application	Ft. Lbs. (N.m)
Ball Joint-To-Control Arm Bolt	
Cabrio	26 (35)
Except Cabrio	(1) 15 (20)
Coupling Rod-To-Control Arm Bolt	33 (45)
Drive Axle Protective Cap-To-Engine Bolt	24 (33)
Drive Axle-To-Flange Bolt	
Cabrio	37 (45)
Except Cabrio	30 (40)
Exhaust Pipe Flange Nut	30 (40)
Front Mount-To-Assembly Bolt (Cabrio)	44 (60)

Left Assembly Mounting Bolt (1) , (2)	
2 Upper Bolts	44 (60)
3 Lower Bolts	30 (40)
Left Mount-To-Assembly Bolt (Cabrio)	44 (60)
Left Mount-To-Transaxle Bolt (Cabrio)	18 (25)
Pendulum Support Bolt (1) , (3)	
Small Bolts	15 (20)
Large Bolts	30 (40)
Selector Lever Cable Bolt (Cabrio)	18 (25)
Starter Bolt	
Cabrio & New Beetle	44 (60)
Except Cabrio & New Beetle	48 (65)
Torque Converter-To-Drive Plate Nut	44 (60)
Transaxle-To-Engine Bolt	
Except New Beetle	
M 10 Bolt	44 (60)
M 12 Bolt	59 (80)
New Beetle	59 (80)
Transaxle-To-Engine Oil Pan Bolt	30 (40)
Wheel Bolt	89 (120)
	INCH Lbs. (N.m)
Cover Plate-To-Transaxle Bolt (Cabrio)	133 (15)
Selector Lever Cable Bolt (Except Cabrio)	71 (8)

(1) Tighten bolts to specification, then an additional 90 degrees.

(2) For bolt locations, see **Fig. 24** and **Fig. 25** .

(3) For bolt locations, see **Fig. 21** .